APPENDIX A
AIR QUALITY CONFORMITY ANALYSIS

The firm of Vanasse, Hangen, Brustlin, Inc., in association with The Louis Berger Group, Inc. was engaged by the Statewide Planning Program to conduct an air quality analysis of the FY 2001-2002 TIP[1] and this plan[2]. The results of that analysis are summarized here and were the subject of consultation with the RI Department of Environmental Management (DEM). The purpose of the analysis is to evaluate the impact of the plan and TIP on the State Implementation Plan (SIP) for air quality.

Background

The Clean Air Act Amendments (CAAA) of 1990 established new requirements for transportation plans and programs. EPA published a final rule on November 24, 1993, with procedures to be followed in determining the conformity of transportation plans, programs, and projects with the SIP. The regulations require that emissions resulting from implementation of plans and programs be less than mobile source "budgets" established in the SIP.

The State of Rhode Island is designated as a "serious" non-attainment area for ozone. The City of Providence is a "maintenance area" for carbon monoxide. The EPA's conformity regulations require that the TIP and long range plans be evaluated for emissions impacts in both nonattainment and maintenance areas. Accordingly, this analysis evaluates change in ozone precursors (volatile organic compounds – VOC and oxides of nitrogen – Nox) and carbon monoxide - CO emissions due to implementation of the TIP and plan.

Methodology

The general modeling process utilized involved two major inputs: link-by-link traffic data from the Rhode Island Travel Demand Model (TDM) and emission factors derived using the EPA's MOBILE5b emission factor model. The TDM was updated in late 2000 to include additional roadways, modeling zones, and current planning assumptions. Consistent with Federal guidance, the traffic data were adjusted to account for the following factors, Highway Performance Monitoring System, seasonal adjustment for pollutants, and peak and off-peak periods.

Emission factors were derived using the EPA's latest mobile source emission factor. The link-by-link traffic data includes daily vehicle volumes as well as free flow and congested speeds over each link. The vehicle volumes are combined with the link lengths in order to determine the daily vehicle miles traveled (VMT) over the link. The VMT is then multiplied by the appropriate speed-specific emission factors in order to arrive at the total daily emissions for each link. The final step is to group the links by functional class in order to arrive at the total daily emissions for each functional class.

The Ground Transportation Plan represents the same projects that were modeled in the analysis of the 2001-2002 Transportation Improvement Program. However, the horizon year and intervening years of analysis were increased by one year to be consistent with FHWA and EPA policy. The base year of 2000 was changed to 2001, the interim year of 2010 was changed to 2011, and the design year of 2020 was changed to 2021. The traffic data for these updated years were developed by taking the TDM traffic volumes for 2000, 2010, and 2020 and increasing them by a one year growth rate developed from HPMS data. The most recent 10

[1] Vanasse Hangen Brustlin, Inc. Rhode Island Air Quality Conformity Analysis 2001-2002 Transportation Improvement Program

[2] Vanasse Hangen Brustlin, Inc. Rhode Island Air Quality Conformity Analysis-Transportation 2020: Ground Transportation Plan 2001 Update

years of HPMS data was evaluated and an average yearly growth rate was calculated. This average yearly growth rate was 2.0828 percent.

Results

Table A-1 presents the model results for VOC, NOx, and CO for all years considered. As shown, all VOC and NOx emission rates fall below the 1999 State Implementation Plan's Budgets and the CO "Build" emissions are lower than the "No-Build" condition for the same year.

In summary, the air quality analysis demonstrates that implementation of the the state's long range transportation plan and TIP is consistent with federal air quality conformity criteria and regulations, and conforms to the air quality goals in Rhode Island's State Implementation Plan.

TABLE A-1

RHODE ISLAND GROUND TRANSPORTATION PLAN

Transportation Conformity Analysis

STATEWIDE MODEL RESULTS

EMISSIONS IN TONS PER DAY

	Rhode Island*				Providence	
	DVMT**	VOC	NOx		DVMT	CO
1999 SIP Budget	--	41.57	46.40		--	--
2001 Base Year	24,798,954	35.20	43.79		3,479,493	130.50
2011 No Build	28,037,990	32.80	40.81		3,746,758	96.34
2011 Build	27,932,428	32.53	40.64		3,711,639	95.04
2021 No Build	30,145,398	35.56	42.66		3,927,798	101.74
2021 Build	30,777,423	36.19	43.52		3,901,525	101.27

* includes local VMT and emissions
** DVMT = Daily Vehicle Miles of Travel